

Claims

- [c1] 1.A method for synthesizing image points representative of laser stripes projected onto the surface of an object in a non-contact gauge measurement system, comprising:
- obtaining a first image of said projected laser stripes from a first camera;
 - identifying at least one corrupted region in said first image;
 - obtaining a plurality of additional images of said projected laser stripes from a corresponding plurality of cameras, wherein said corresponding plurality of cameras are each displaced from said first camera;
 - identifying at least one point in each of said plurality of additional images corresponding to a target point in said corrupted region of said first image;
 - determining the three-dimensional position of said at least one point using said plurality of additional images; and
 - utilizing said determined three-dimensional position of said at least one point to synthesize a data point in said corrupted region representing said target point.
- [c2] 2.The method of Claim 1 for synthesizing image points wherein the step of identifying at least one corrupted region in said first image includes identifying points in said first image representative of local maxima.
- [c3] 3.The method of Claim 2 for synthesizing image points wherein a region is identified as corrupted if no points in said region are representative of local maxima.
- [c4] 4.The method of Claim 2 for synthesizing image points wherein a region is identified as corrupted if points identified as representative of local maxima form an unstructured pattern.
- [c5] 5.The method of Claim 1 for synthesizing image points wherein the step of determining the three-dimensional position of said at least one point includes triangulating a laser stripe in said plurality of additional images.
- [c6] 6.The method of Claim 1 further including the step of utilizing a template structure to establish said target point in said corrupted region of said first

image.

[c7] 7.The method of Claim 1 wherein said determined three-dimensional position of said at least one point is utilized to project a data point corresponding to said target point in said corrupted image region.

[c8] 8.A method for synthesizing image points representative of laser stripes projected onto the surface of an object in a non-contact gauge measurement system, comprising:
obtaining a first image of said projected laser stripes from a first camera;
identifying at least one corrupted region in said first image;
utilizing a predetermined template structure to select a target point on a portion of a chosen laser stripe passing through said corrupted region;
obtaining an additional plurality of images of said projected laser stripes from a corresponding plurality of cameras, wherein said corresponding plurality of cameras each have a known geometry and are each displaced from said first camera;
utilizing said predetermined template structure and epi-polar geometry to identify a data point on said image of said chosen laser stripe in a first of said additional plurality of images, said data point corresponding to said selected target point;
utilizing said data point and epi-polar geometry to identify a laser stripe in a second of said additional plurality of images corresponding to said chosen laser stripe; and
utilizing said known geometry of said cameras, together with said data point and said identified laser stripe to synthesize a representative point in said corrupted region through projection.

[c9] 9.The method of Claim 8 for synthesizing image points wherein the step of identifying at least one corrupted region in said first image includes identifying points in said first image representative of local maxima.

[c10] 10.The method of Claim 9 for synthesizing image points wherein a region is identified as corrupted if no points in said region are representative of local maxima.

- [c11] 11.The method of Claim 9 for synthesizing image points wherein a region is identified as corrupted if points identified as representative of local maxima form an unstructured pattern.
- [c12] 12.The method of Claim 8 for synthesizing image points wherein the step of determining the three-dimensional position of said at least one point includes triangulating a laser stripe in said plurality of additional images.
- [c13] 13.The method of Claim 12 wherein said determined three-dimensional position of said at least one point is utilized to project a data point corresponding to said target point in said corrupted image region.

Approved for Release